

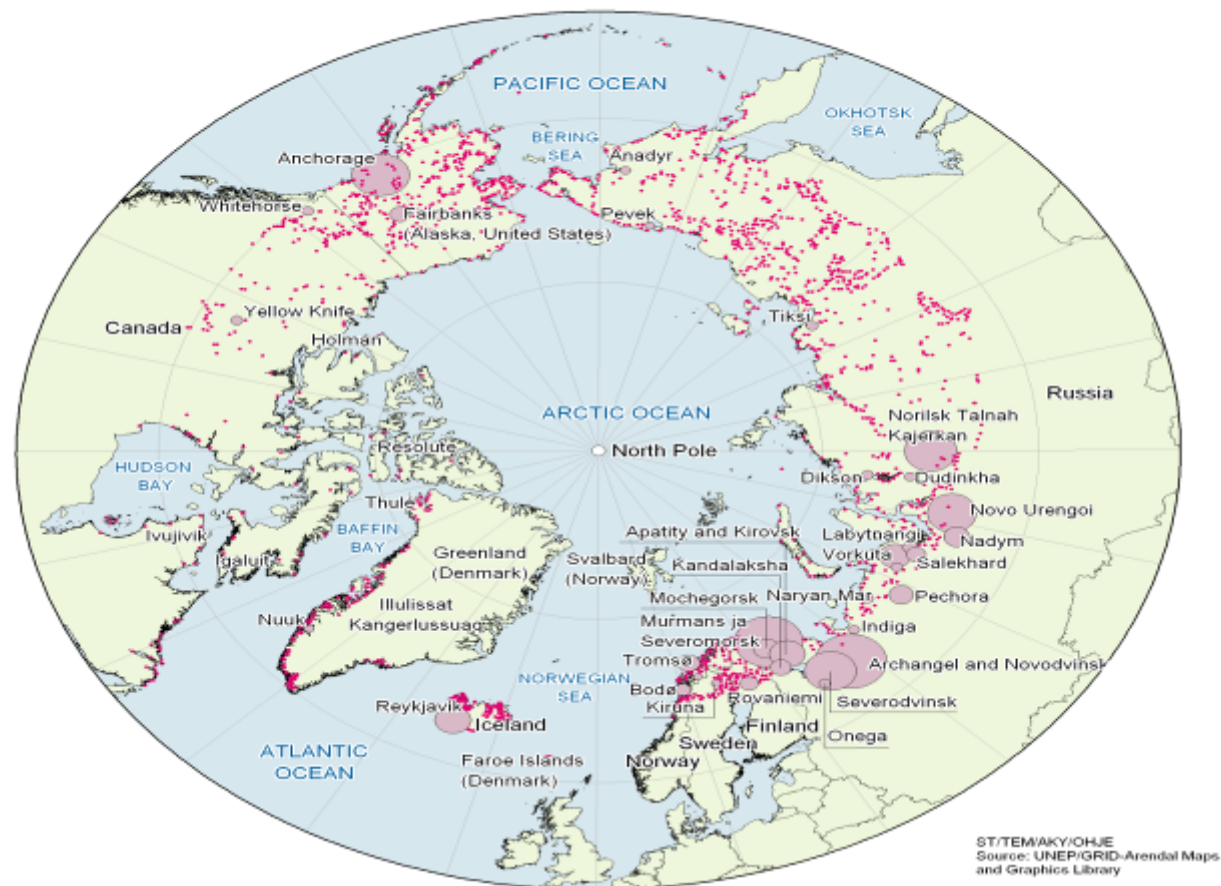
# FINNISH VIEWS ON ARCTIC OPERATIONS AND CAPABILITIES

*Washington DC  
July 17th, 2013*

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#### POPULATION IN AGGLOMERATIONS



The little red dots indicate concentrations of fewer than 20 000 people and very small communities.











***It was only in 1878 that Finnish-Swedish explorer Nordenskiöld made the first complete passage of the North East Passage from west to east.***





# ***Why an Arctic Strategy?***

- The importance of the Arctic Region has grown notably. Benefiting from the emerging opportunities and protecting the fragile Arctic environment requires real time information of the situation.
- All eight Arctic countries have now updated their Arctic strategies.
- The strategy is not the final measure but rather a starting point in shaping Finland's Arctic policy.





# Content

- The infrastructure is still lacking both onshore and offshore.  
**The infrastructure needs to be improved in collaboration with neighbouring countries. This requires a common vision.**
- The indigenous peoples of the region (The Sámi in Finland) are most vulnerable to emerging threats and rapidly changing living environment.  
**The rights of indigenous peoples must be secured.**
- **The most important institution in the Arctic Region is the circumpolar Arctic Council**, which includes all eight Arctic countries and indigenous peoples (A8+). On the regional level the Barents Euro-Arctic Council and Barents Regional Council are vital fora.





# ***The Finnish Government Programme***

- The Arctic Region offers substantial potential to Finland
- The Finnish Expertise in the Arctic promoted
- International cooperation in the region will be increased to enhance business opportunities
- In mining and exploitation of resources ecological sustainability and Indigenous peoples' rights respected





# ***FINNISH ARCTIC ACTIVITIES***

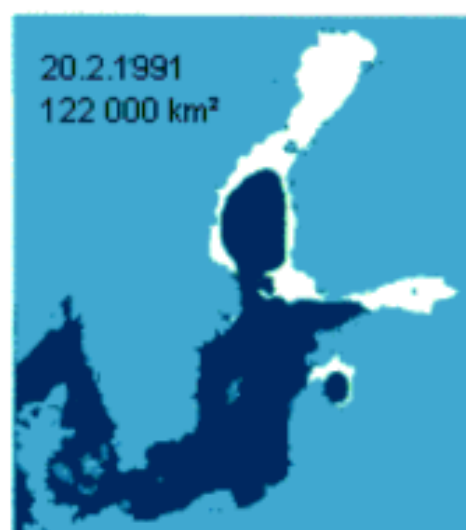
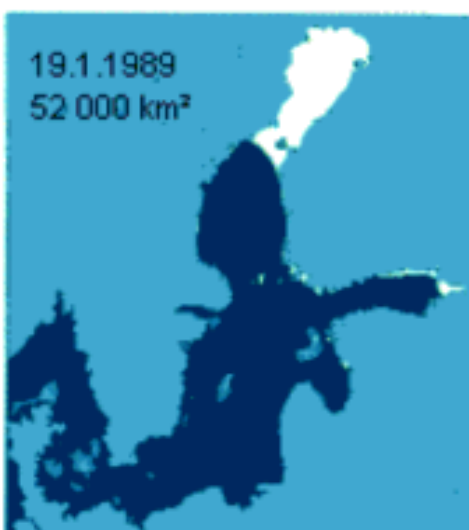
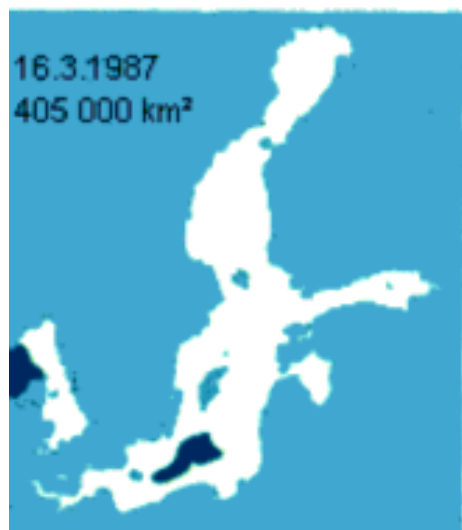
Examples of Arctic capabilities:

- **Arctic shipping experience**
- Arctic ship design capabilities
- Arctic oil recovery capabilities





# ICE COVERAGE OF THE BALTIC SEA

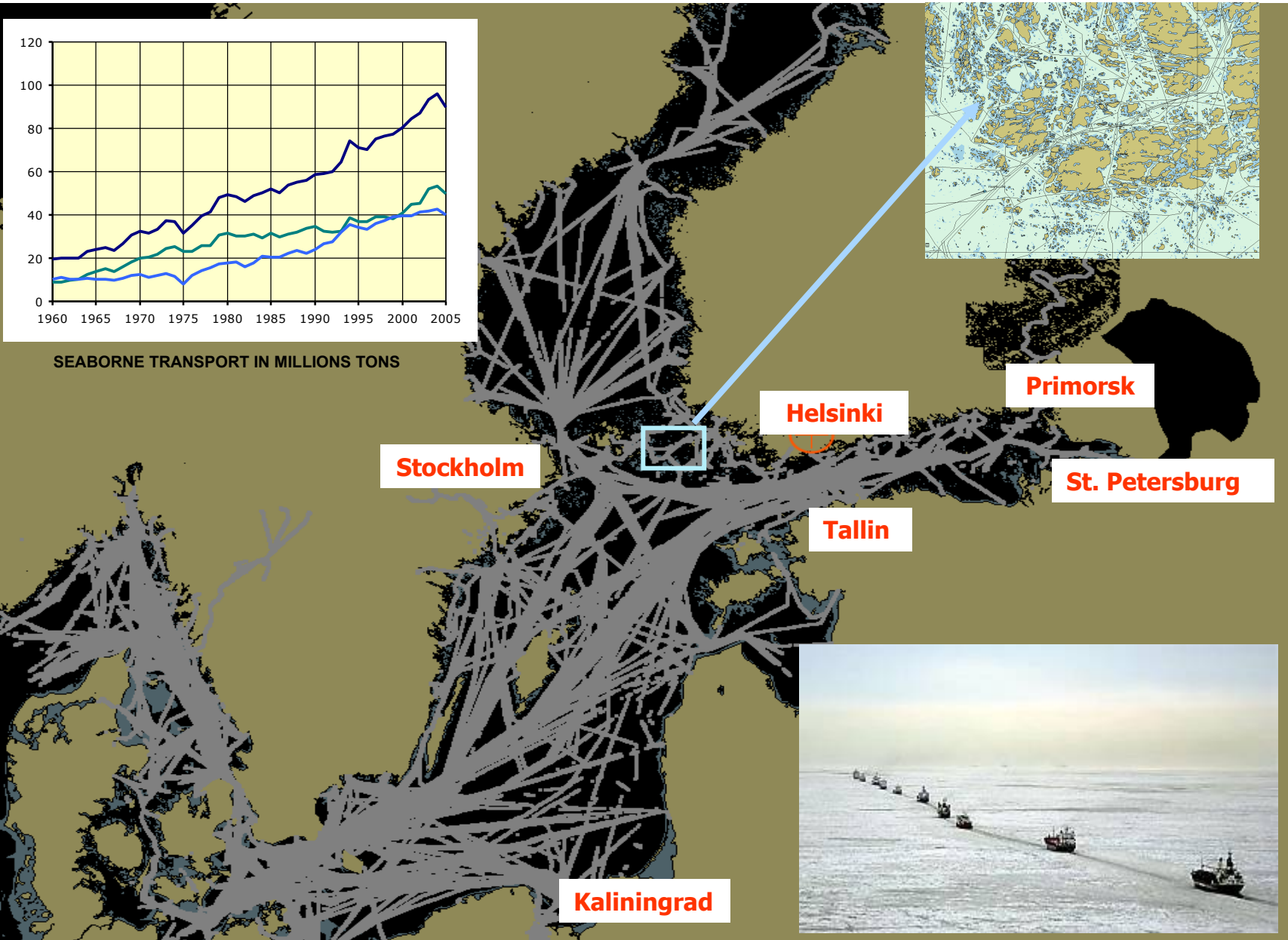


Maps by Jouni Vainio





# The Baltic Sea





# ***FINNISH ICE BREAKER FLEET***

## ARCTIA SHIPPING

BOTNICA



FENNICA



NORDICA



VOIMA



SISU



URHO



KONTIO

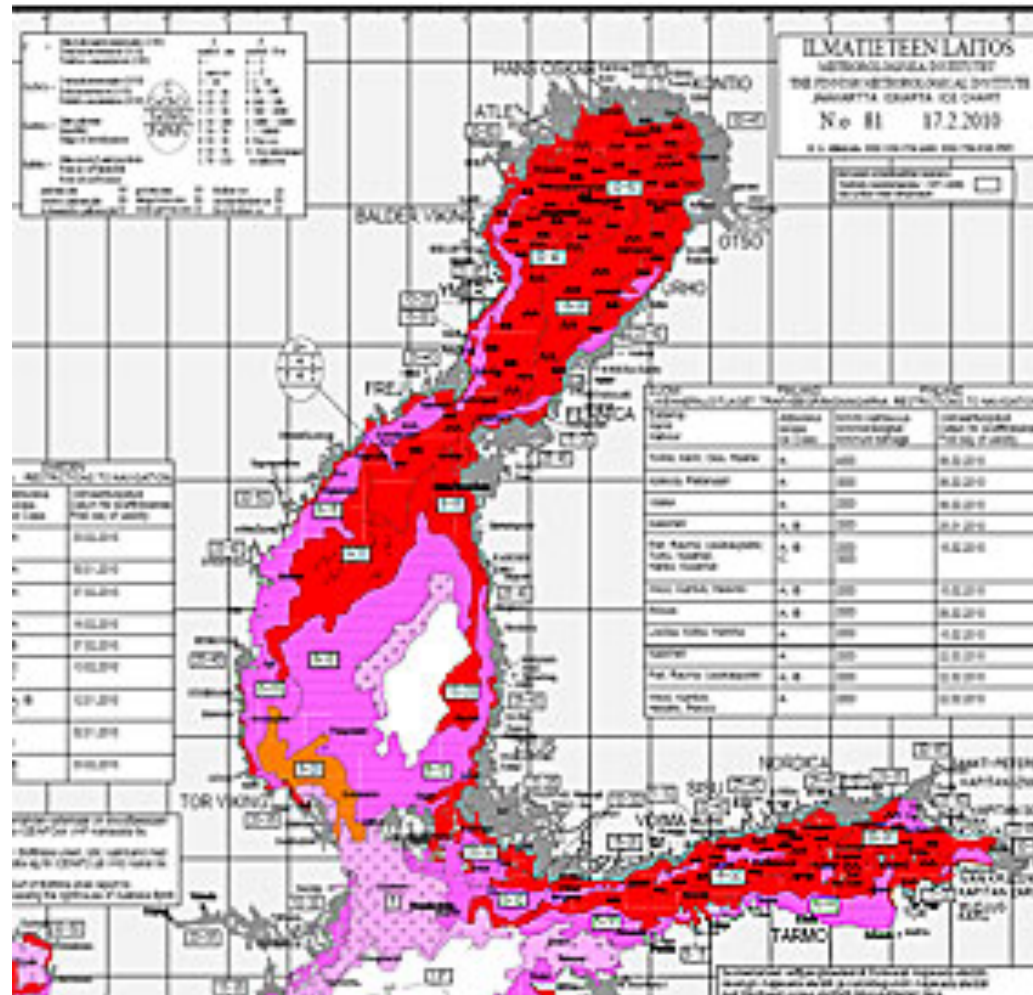


OTSO





# Ice-map: Essential tool









# ***FINNISH ICEBREAKERS TO OPERATE IN ALASKA***

- **A new chapter in the story of Finnish icebreakers**  
**Multi-purpose icebreakers Fennica and Nordica operated in the Alaskan oil fields during the summer 2012**
- Arctia Offshore Ltd has signed an important agreement on chartering out its multi-purpose icebreakers **Fennica** and **Nordica** outside the Finnish icebreaking season. Over the years 2012 -2014, the vessels will support oil and gas production operations on the north coast of Alaska under a contract of charter with the major international oil company Shell. Their operating area is (was) the Chukchi and Beaufort Seas.





# ***ENVIRONMENTAL SOLUTION TO VOLATILE ARCTIC ENVIRONMENT***

- **Wärtsilä supplied catalytic converters to Finnish multipurpose icebreakers**
- Wärtsilä, the marine industry's leading solutions provider, was contracted by Finland-based Arctia Offshore Oy to carry out modification work to two of the company's vessels.
- The turnkey project involved the fitting of combined Wärtsilä NOx Reducer (NOR) and Oxidation Catalysts (OXI) to the MSV Fennica and MSV Nordica, both of which are multi-functional vessels based on a modified icebreaker design. The ships were also converted to enable the use of Ultra Low Sulphur Diesel fuel.
- ***With this conversion work the vessels fulfilled the United States Environmental Protection Agency's (EPA) emission requirements for operating in the Arctic Ocean.***









# ***FINNISH ARCTIC ACTIVITIES***

Examples of Arctic capabilities:

- Arctic shipping experience
- **Arctic ship design capabilities**
- Arctic oil recovery capabilities





Aker Arctic was established in 2005  
as a spin off from Aker Yards.

Unique unit of engineering and design  
resources combined with an ice  
model test basin

The independent role – separation  
from the shipyard – opened up the  
global market, something which had  
not been possible earlier

<http://www.akerarctic.fi/>



# **Aker Arctic**

***Want to know what they recommending and therefore acquire the design basis data. In recent winters worked full scale in Northern Barents Sea, Kara Sea and Sea of Okhotsk***

And acquired data previously in:

- Barents Sea, 1991/1992/1993/2001/2005/2008/2010/2011
- Pechora Sea, 1992/1993/1994/1998/1999/2011
- Kara Sea, 1993/1995/2006/2007/2008/2011
- Ob Bay, Yamal, 1995/1996/1998/2000/2010/2011
- Sakhalin, 1990/1991/1992/1997/1998/2007/2008
- Canada Arctic archipelago 2007
- Baltic, 1994-98/2003/2009/2010/2011
- ARCDEV 98, EU-funded experimental voyage by M/T “Uikku” to Tambey in Yamal peninsula in winter 1998, “Kapitan Danilkin” voyage to Yamal 2011
- M/T “Uikku” Northern Sea Route passage as first foreign merchant vessel 1998

Source: Aker Arctic

26 13:19



## ***Aker Arctic***

***One of assets is the full-scale experience, with ships and ice conditions, forming the widest correlation database among the ice tanks***



▪ BALTIC SEA, Scandinavia	100
▪ LAKE SAIMAA, Finland	10
▪ LAKE VÄNERN, Sweden	1
▪ ARCTIC, Canada	12
▪ ALASKA, USA	2
▪ GREAT LAKES, USA	3
▪ ANTARCTIC	5
▪ ARCTIC, Russia	37
▪ ARCTIC, Greenland, Spitzbergen	3
▪ RIVERS, Russia	13
▪ SAKHALIN, Russia	7
▪ CASPIAN SEA, Kazakhstan	2

Source: Aker Arctic



# Aker Arctic – the Full Service Arctic Technology Company

We need to participate in project execution for the accumulation of practical experience:

- Tender packages, Technical Projects
- License agreements, Project executions
- Basic Design packages, especially for new concepts of own technologies
- Experienced naval architects with yard background

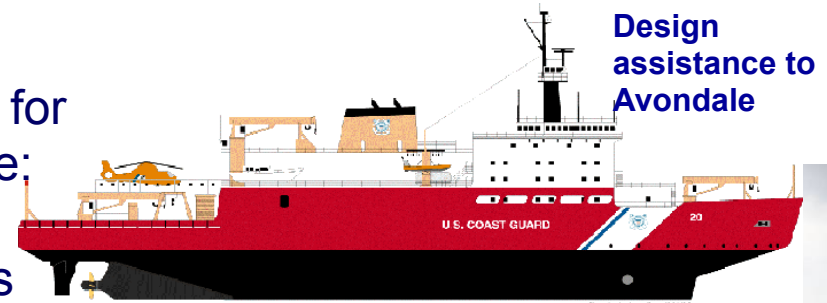
Ice navigation training



Transport systems in practice



LNG: Co-operation with e.g. STX Finland and Russian yards



Design assistance to Avondale



Basic design packages. e.g. to Admiralty Shipyards, STX Romania



Licence arrangements with other yards like Sumitomo or SHI

Source: Aker Arctic





# *Aker Arctic was involved in the development of the Healy and assisted Avondale Shipyard with design of the propulsion system*

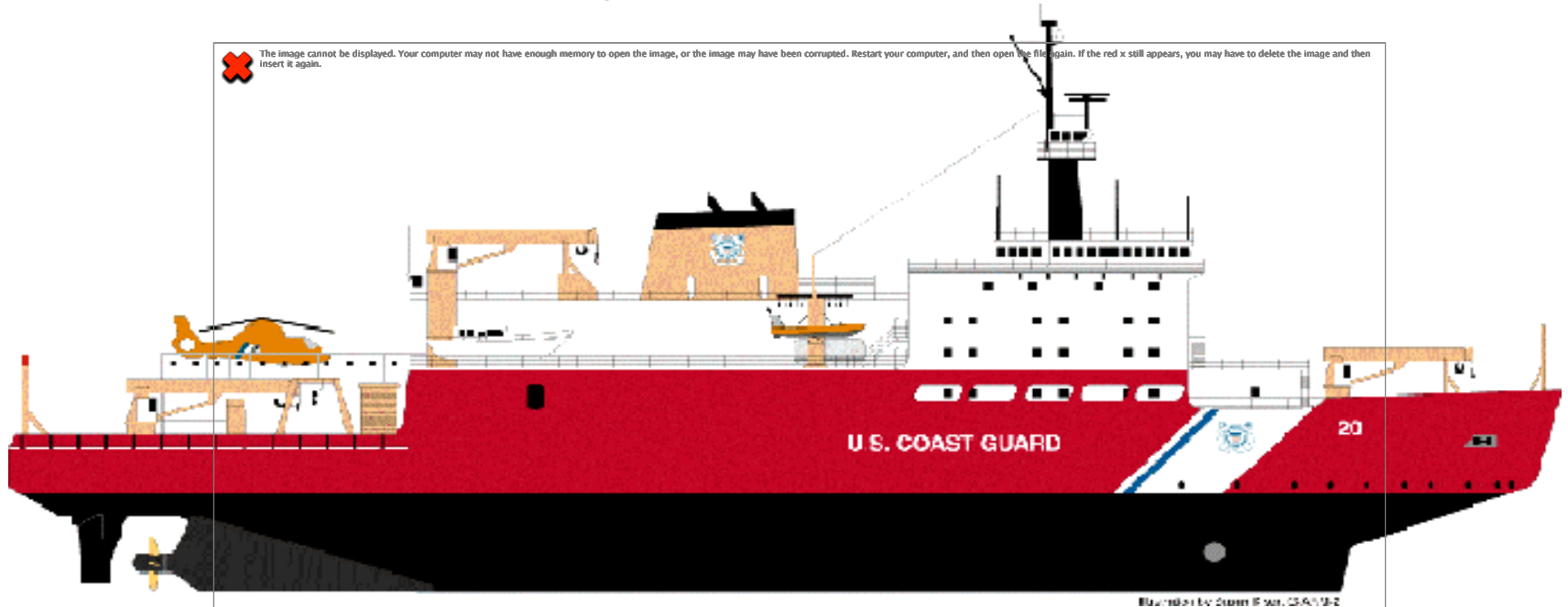


Illustration by Stephen B. Lee, USCGC-903



29-Jul-13

Slide 22

Source: Aker Arctic



# ***Aker Arctic – Center of Excellence specialising in tailored solutions for winter and Arctic operations***

## ***The ice technology partner***

### Field research

- Ice conditions
- Ice properties
- Route selection
- Design basis development

### Concept development

- Basic design
- Feasibility studies
- Performance predictions
- Simulations

### Testing in model and full scale

- Verification of R&D results
- Ships and structures
- Floaters, Offloading operations
- Ice management
- Rescue and evacuation





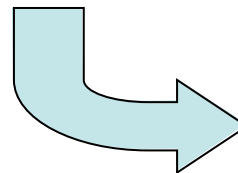
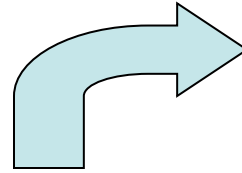
*The investments in new mooring systems have been well utilised, and new innovative solutions have already been developed and studied further*





# *Aker Arctic: What has been achieved more recently*

Examples of recent achievements and ongoing new developments



**Aker Arctic DAS™  
"double-acting"  
vessel concept**



**New multipurpose and  
icebreaker vessel  
concepts**



**New innovative approaches**



Source: Aker Arctic





# ARCTIC DESIGN



**Double Acting Tanker M/T Tempera**

**Oblique Icebreaker - Breaks wide channel going sideways (pat.)**



Source: Aker Arctic





***The first Oblique Concept ARC 100 vessel has been ordered by Russian Ministry of Transport and is now constructed by Yantar and Arctech yards.***



Source: Aker Arctic



***Recent projects in North America include the John F. Diefenbaker Polar IB and the AOPS for Canada - and the IBAHS Aiviq for Shell Alaska***





# ***FINNISH ARCTIC ACTIVITIES***

Examples of Arctic capabilities:

- Arctic shipping experience
- Arctic ship design capabilities
- **Arctic oil recovery capabilities**





# Finland's Newest Oil Spill Response Vessel



**The Baltic Sea's newest multi-purpose oil and chemical spill response vessel equipped with Lamor's newest oil spill recovery (OSR) technology and solutions, YAG Louhi, begins operations in the Gulf of Finland in mid-2011.**

Commissioned by the Finnish Environment Institute (SYKE), the €48 million YAG Louhi is based at the Port of Upinniemi approx. 40 kms west of Helsinki in the archipelago. Louhi, with our side mounted skimmers, is capable of collecting 1,200 tons of spilled oil during just one trip.





# *Lamor Built-In Oil Recovery System (LORS)*



Source: Lamor







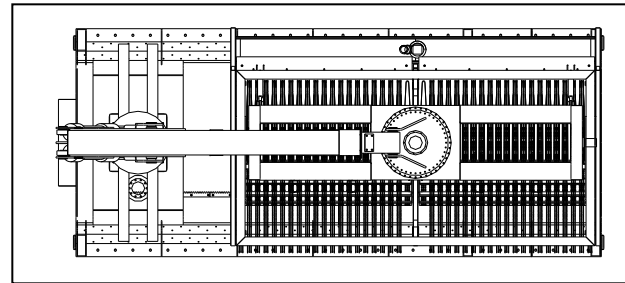
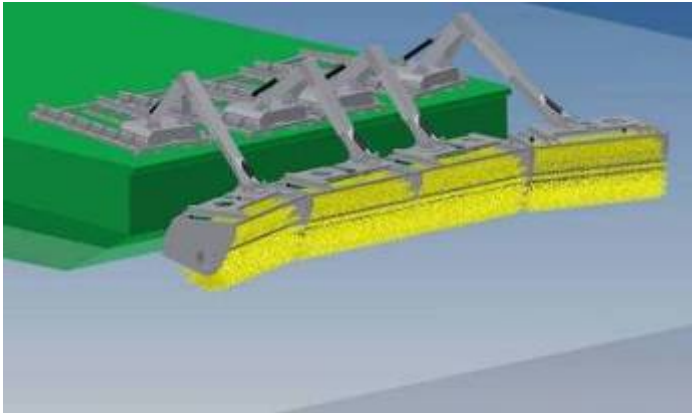
© Ilkka Lastumäki  
MarineTraffic.com





# Oil Recovery

**Aker Arctic introduce new Finnish brush system in all AARC's new OSV proposals for the Arctic conditions**



**Oil combat module:**  
Can be built in 6 m brush width,  
securing a 24 m wide sweeping area





# *Lamor Oil Recovery Bucket (LRB)*

- The LRB can be effectively operated by a crane on board a vessel or excavator.





# INNOVATIVE ICE-BREAKING SOLUTIONS?



© Chris Westwood / The Sun





# *Or maybe not*



- The curious polar bear cub appears to be pushing the ship, M/S Expedition, out of his territory when it came too close to the Norwegian islands of Svalbard.
- The bear was photographed during an adventure cruise to the remote archipelago, which lies halfway between Norway and the North Pole in the Arctic Ocean.



# Production of the new Finnish Border Guard offshore patrol vessel



The vessel will use the latest technologies and environmentally friendly innovations. She is equipped with machinery using liquefied natural gas (LNG) and marine diesel as fuel.

The vessel is capable of operating in Baltic Sea ice conditions.

- Deputy Chief of the Finnish Border Guard, Rear Admiral **Matti Möttönen** points out that the new patrol vessel will be a significant addition to Finland's maritime offshore capacity. *"The ship will provide an efficient command platform for management of official tasks, and with its extensive sensory equipment it is capable of supervising the sea area under any circumstances. In addition, with a view to protection of the Baltic Sea, it is important that equipment is reliable under any circumstances and capable of effectively limiting damage in case of accidents."*





# ***Gulf of Finland Reporting System as an example***

- GOFREP in the Gulf of Finland is a Mandatory Ship Reporting System under SOLAS (IMO, International Convention for the Safety of Life at Sea, 1974) Regulation V/11.
- The traffic centres TALLINN TRAFFIC, HELSINKI TRAFFIC and ST. PETERSBURG TRAFFIC monitor shipping movements and provide advice and information about navigational hazards and weather conditions in the Gulf of Finland.





# Questions?

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